

# THE MINERAL INDUSTRY OF UNITED KINGDOM

By Harold R. Newman

Mine production of ferrous and nonferrous minerals has been declining for the past 20 years as reserves became depleted. Because processing has become the basis of a large and economically important mineral industry, imports are required to satisfy metallurgical requirements.

The industrial minerals sector has provided a significant base for expanding the extractive industries and the balance has shifted away from the metallic mineral sector. Companies have a substantial interest in the production of domestic and foreign industrial minerals, such as aggregates, ball clay, china clay (kaolin), and gypsum.

The offshore U.K. sector of the North Sea Oilfield, in its 32d year of activity, continued to be significant in international oil and gas activities. As a result, the country has become headquarters for international oil companies and a major energy supplier to other countries.

The current statute regarding the development and working of mineral deposits is called the 1971 Act. This Act consolidates all earlier planning legislation and has been amended by various statutes. Minerals were defined in section 209 of the 1971 Act to include all minerals and substances in or under land of a kind ordinarily worked for removal by underground or surface workings, except it does not include peat cut for purposes other than for sale. Mineral development was specifically addressed in the Town and Country Planning (Minerals) Regulations, 1971, and the Town and Country Planning (Minerals) Act, 1981.

Mineral rights to mineral fuels, such as coal, petroleum, and uranium, belong to the State. The Coal Authority, was authorized to license open-pit and underground mines to the private sector subject to restrictions on size and the payment of a royalty on the amount of coal produced. Before privatization, British Coal Corp. controlled almost all the mineral rights to the national coal reserves.

Most other mineral rights in Great Britain are privately owned. The exception is gold and silver, the rights to which are vested in the Royal Family and are referred to as "Crown Rights." A different situation regarding mineral rights applies to Northern Ireland where, under the Mineral Development Act (Northern Ireland), 1969, the right to work minerals and the right to license others to do so is vested in the state, as opposed to private ownership.

Currently, the United Kingdom has no national registry for mineral rights except for hydrocarbons. This has created problems for and is a matter of concern to the mining industry. Locating current owners of mineral rights on some properties can be a costly and time-consuming process.

Operations in the steel sector showed moderate improvement

as the demand for steel increased. Production of tin concentrate continued from the one remaining tin mine in Cornwall. (*See table 1.*)

The United Kingdom has shifted from being a net exporter of goods to being a net importer as recently as 1986. Part of the reason for the weaker export performance has been problems in its sector of the North Sea oil field. These mostly have been resolved. Other contributing factors were adverse currency exchange rates with trading partners and a petroleum surplus. The export trade is dominated by petroleum.

Table 2 shows the impact of selected classes of mineral commodities on the UK's balance of payments position in relation to the European Union and the world. The figures are for 1995, the latest year for which data were available. (*See table 2.*)

The Department of Trade and Industry (DTI) ensures a continuing supply of minerals for the country's industry. Its areas of responsibility include all nonenergy minerals, including metallic ores, and industrial minerals, including barite, china clay (kaolin), fluorspar, high-grade limestone, potash, salt, and silica sand. The industrial minerals sector, in particular, is important to the nation's economy. (*See table 3.*)

Through its new Metals and Minerals Branch, DTI is responsible for mineral fuels, including coal, natural gas, and petroleum, and for issuing licenses for the exploration, appraisal, and production of natural gas and petroleum. These activities had been overseen by the Department of Energy (DOE).

DOE remained responsible for minerals that are used in the construction industry. These include aggregates, brick and brick clay, cement and its raw materials, dimension stone, gypsum for plaster, and sand and gravel. State and privately owned corporations produce minerals and mineral-based products. State ownership was mostly in the nuclear power industry. (*See table 4.*)

Of the four primary aluminum smelters in the United Kingdom, three are owned and operated by British Alcan Aluminium Ltd., the U.K. subsidiary of Montreal-based Alcan Aluminium Ltd. The fourth smelter, operated by Anglesey Aluminium Ltd., is owned by Rio Tinto Ltd. (51%) and Kaiser Aluminum and Chemical Corp. of the United States (49%). All of the aluminum smelters depend on imported alumina for feedstock.

In 1995, British Alcan announced divestment of 12 downstream businesses as a part of its strategy to concentrate on the three core areas of aluminum smelting, rolling, and aluminum chemicals production. In February 1996 a new company, British Aluminium Ltd, was formed, with the \$320

million sale of the downstream businesses to a group of institutional investors. The new company, British Aluminium, will manage the largely aluminum-product-related businesses. Included is MEL Chemicals UK, a world leader in the production of fused zirconia and zirconia chemicals. The production facilities are in the United States (Industrial Minerals, 1996).

The secondary aluminum metal industry treats recycled aluminum and low-grade aluminum scrap, such as swarf. The main consuming sector for secondary aluminum ingots is the automotive industry. Ellay Enfield Ltd., one of the major independent producers of precision seamwelded aluminum and brass tubing for heat transfer applications in the automotive industry, was acquired by Lausanne Hydro Aluminium Extrusion of Norway for an undisclosed sum (Norsk Hydro ASA, 1997).

The MIDAS project, a major investigation of gold mineralization at numerous deposits in the Caledonian and Hercynian orogenic belts of Europe, was completed under the leadership of the British Geological Survey. Evaluation of multidisciplinary digital data for selected deposits allowed a classification of the types of gold mineralization to be established. On this basis, metallogenic models were presented in the final report and the optimum exploration methodology for each deposit type was defined.

Activities in gold exploration and development in the United Kingdom increased in 1996. Northern Ireland, Scotland, and Wales continued as the three main areas of exploration by companies. Scotland was the most active area with several exploration licenses in effect.

Caledonia Mining Ltd.'s Cononish gold project near Tyndrum, 60 miles north of Glasgow, was slated to start production in the third quarter of 1997 with an annual production anticipated to be 778 kilograms (kg) gold equivalent. The deposit, estimated to contain 449,000 metric tons (t) of reserves that can be mined, is contained within a northeast-striking, auriferous, quartz-sulfide vein in quartzites and pelites. The sulfides consist of chalcopyrite, galena, pyrite, and sphalerite; the gold occurs with galena in pyrite microfractures. The mine carries a capital cost of about \$11 million and an estimated life of 11 years (Northern Miner, 1996).

Omagh Minerals Ltd., a wholly owned subsidiary of European Gold Resources Inc. of Canada, received formal governmental consent for its open pit gold mine at Cavanacaw, County Tyrone, Northern Ireland. The 189 square kilometer concession reportedly contains a large number of gold deposits and occurrences and established gold resources. A cluster of lode and open-ended shear structures in or adjacent to the Kearney Structure contains an estimated mineral resource inventory of more than 2 million metric tons (Mt) of ore grading 6.9 grams per metric ton (g/t) of gold equating to about 14,000 kg. The company estimated it could have an initial production of more than 500 kilograms per year (kg/yr) of gold and more than 600 kg/yr of silver. Exploration was continuing to define further reserves. This project would be the first gold mine in Northern Ireland (Omagh Minerals Ltd. unpub. news release accessed November 6, 1996, on the World Wide Web at URL <http://gold.ica.net/irishpro.htm>).

Ennex International Plc, operating as Ulster Minerals Ltd., reported that its Curraghinalt deposit in the Sperrin Mountains near Gortin, County Tyrone, Northern Ireland, contained an estimated probable "resource" of 500,000 t of ore grading 15 g/t of gold. Exploration was continuing in an attempt to block out sufficient ore to justify mine development. Ennex was planning to drill an additional 60 holes by yearend, after which a feasibility study would be carried out to determine the profitability of the project (Murdoch, 1996).

Crediton Minerals Plc, a subsidiary of MinMet Plc of Ireland, planned to carry out a two-year exploration program for gold and silver in Devon, in an area known as the Crediton Trough, located to the north and west of Exeter. Crediton has secured a prospecting permit from the Crown Estate Commissioners. The British Geological Survey (BGS) has been appointed to provide technical services and manage the project. BGS had found significant detrital gold in the course of drainage sampling and subsequently geochemical evaluation identified anomalous levels of gold in volcanic rocks of Permian age. The project will focus on locating gold targets at shallow depth (Mining Journal, 1996).

Production of iron ore was limited to a small amount of hematite ore mined by Egremont Mining Co. at the Florence Mine in Cumbria. Primary steel production was based on imported iron ore, mainly from Australia and Brazil.

British Steel (BS) is Europe's largest steel producer, and the third largest in the world after Nippon Steel of Japan and Posco Steel of Korea, with group sales of more than \$12 billion. About 13 million metric tons per year (Mt/yr) of liquid steel are produced by the Basic Oxygen Steelmaking (BOS) process. Although traditional ingot casting is still used in the manufacture of certain grades of steel, most of the output is by means of continuous casting.

Section and plate production is principally undertaken at the integrated steelworks of Teesside and Scunthorpe, with the manufacture of pipes and tubes at Corby and Hartlepool and rails at Workington. Flat-rolled strip steel is made at Port Talbot and Llanwern. Further processing is undertaken at Lianelli and Ebbw Vale for tin plate and at Shotton for galvanizing and painting. (British Steel Plc, 1996).

BS announced that because of overcapacity in the European tinplate market, they were implementing a company wide cost-cutting plan that would result in the loss of more than 1,000 thousand jobs a year for the next 5 years.

In May, BS unveiled what was considered to be the most significant technological innovation in steel construction in more than 40 years in a revolutionary new flooring system combining the world's first hot-rolled asymmetric beam and the advanced floor deck, SD225. The asymmetric beam is up to 25% lighter than conventional beams. The SD025 is an improved floor-deck profile with greater load-carrying capacity, a longer span range, and improved service integration capabilities compared with current decks. These two innovations make up the Slimdek system.

The Slimdek system provides several crucial benefits for the construction of multistory buildings. Some of these benefits include composite action, reduced floor depth, giving potential for more useable floor space, of one floor in every eight in high

rise buildings, so a 40-storey building could have five extra floors; fire resistance of 60 minutes without additional protection; reduced weight and fabrication cost; and enhanced thermal performance. The asymmetric beam, the first new steel section shape for more than 40 years, will be rolled at BS's Universal Beam Mill at Teesside, which has been upgraded by the company (British Steel Plc, 1996).

South Crofty Holdings Ltd., 96% owner of the South Crofty Mine in Cornwall, initiated a \$4.8 million major improvement program for the more efficient recovery of tin ore, including deepening of the mine to the 470 Fathom Level. Production levels were increased, with a resulting decrease in unit production costs. In the last quarter, tin grades averaged 1.55%, compared with 1.22% for the previous year. Mill recoveries have been improved to 89.7%, compared with 86.7% for the previous year. The Wheal Jane mill ranks as one of the most efficient tin concentrators in the world. Current ore reserves were estimated to be 3.2 Mt at an ore grade of 1.5% containing about 45,000 t of tin (Wright, 1996).

The UK's two largest cement producers were Blue Circle Cement Ltd., with 49% of the domestic market and Castle Cement Ltd. with more than 25%. Blue Circle stepped up its presence in North America with its first Canadian acquisition. The company agreed to pay \$261 million for St. Mary's Cement Corp., which supplies about 25% of Ontario's cement sales. The province is home to about 40% of Canada's population (Financial Times, 1997).

The United Kingdom was the leading world producer and exporter of ball clay, as well as the world's largest exporter and second-largest producer, after the United States, of kaolin (china clay). Watts, Blake, Bearn & Co. Plc (WBB) was the country's largest producer of ball clay. English China Clays Plc (ECC) was the largest producer of kaolin and one of the major producers worldwide. Operations were mainly in the southwestern area of the United Kingdom. WBB Devon Clays Ltd. is responsible for the ball clay operations of WBB. The division operated eight open-pit and three underground mines that have a total combined output of 500,000 metric tons per year (t/yr) of crude ball clay.

ECC Ball Clays Ltd. is responsible for the ball clay operations of ECC. The division operates five quarries and three underground mines that have a combined output of 450,000 t/yr of crude ball clay.

ECC International Ltd. (ECCI) operated ball clay and kaolin mines and quarries in the Wareham Basin, in Dorsetshire; in the Bovey Basin, in south Devonshire; and in the Petrockstowe Basin in north Devonshire. A majority of the production is from the Bovey Basin.

Fluorspar mining is concentrated in Derbyshire from the Southern Pennine deposit, and the major producer was Laporte Industries Plc. Laporte operated two underground mines and one open-pit mine. The ore is processed at Laporte's Cavendish Mill near Sheffield.

Deepwood Mining Co. Ltd. announced that it is to develop a new fluorspar deposit. Deepwood was granted permission to develop a new deposit which lays adjacent to its existing Ball Eye Quarry. An exploration program identified a large vein grading 50% to 80% calcium fluoride with 10% to 20% lead. It

is this deposit that Deepwood intends to develop in the near future. Deepwood undertook an exploration program to ascertain the full extent of a high-grade barite deposit (Industrial Minerals, 1996).

British Gypsum Ltd. (BG), a subsidiary of BPB Industries Plc, was the major producer of gypsum in the United Kingdom. The company has mines in Cumbria, Leicestershire, Nottinghamshire, Staffordshire, and Sussex that produce about 3 Mt/yr of gypsum. With few exceptions, this material goes to supply the domestic market.

Cleveland Potash Ltd. (CPL), the only potash producer in the United Kingdom, operated the Boulby Mine in Yorkshire. CPL also mined rock salt, as a coproduct, from an underlying seam in the Boulby Mine. The potash-to-salt production ratio was about 2:1.

Most slate mining in the United Kingdom was in northern Wales, with additional mining operations in Cornwall and the Lake District. Penrhyn Quarries Ltd., Bangor, Wales, the largest slate operation, produced about 25,000 t/yr of roof slate. The quarry, measuring 2,415 by 805 meters, (m) is considered to be the world's largest slate quarry. Penrhyn produced more than one-half of the United Kingdom's entire production of roofing slate. The company exported about two-thirds of its production.

Ledmore Marble Ltd., a subsidiary of Anglo Pacific Resources Plc, has developed a marble deposit at Ullapool for dimension stone markets. Ledmore shipped 190 t of marble block to Carrara, Italy, by train. In a fine example of mine-to-market logistics, the marble was taken from the deposit by truck to the railhead at Lairg, transferred to the Inverness-Wick rail line then onto a Transrail freight train via the English Channel Tunnel to Carrara, Italy (Industrial Minerals, 1996).

The European Commission authorized the United Kingdom to provide \$1.4 billion to its coal industry through 2002. The money would cover liabilities, including environmental damage caused by mining activities and obligations to former workers such as pension plans and social welfare benefits inherited from the period before BC was privatized. The aim is to insure that inherited liabilities do not place a burden on mines with prospects of economic viability (Coal Age, 1997).

By the beginning of 1996, most of the coal mining industry was owned by RJB Mining which operate 16 underground and 19 open-pit mines with estimated reserves of 540 Mt and 20 Mt, respectively. RJB is the largest coal mining company in the United Kingdom and the largest independent coal producer in the European Union. In 1996, RJB produced an estimated 35 Mt of coal, of which about 80% was from underground operations. The largest operation was the underground Selby Complex, which produced about 12 Mt/yr. Mining (Scotland) Ltd. acquired all operations in Scotland (nine open-pit sites and the underground Longannet Mine) with estimated coal reserves of 70 Mt, and Celtic Energy Ltd. acquired all operations in Wales (nine opencast sites) with estimated coal reserves of 50 Mt (World Coal, 1997).

Plans for the Interconnector natural gas pipeline were approved. The Government had indicated its support for the private sector project in the context of the future integration of European trade in natural gas. The 243 kilometer (km)-long,

\$425 million, 20-billion-cubic-meter-per-year capacity natural gas pipeline would be built from the Bracton terminal, Norfolk, to Zeebrugge, Belgium and link the United Kingdom to the Continental gas grid. It is expected to come into operation by yearend of 1998. The first natural gas to enter the proposed pipeline likely would come from the Britannia field jointly operated by Chevron Ltd. and Conoco Ltd. Britannia was the largest offshore gas field under development (Department of Trade and Industry, 1996).

New petroleum and natural gas discoveries were anticipated with the offer of more than 270 blocks for exploration in frontier areas under the 17th offshore licensing round in 1996. The blocks are in areas where there has been little or no exploration activities. Most are to the west of Scotland but others are in the South West Approaches, the northern North Sea, and off the east coast of England. Companies have 1 year to prepare their licenses (Department of Trade and Industry, 1995).

The United Kingdom has an onshore producing oil field, the Wytch Farm Field in Dorset, containing estimated reserves of 450 million barrels. The field extends offshore under Poole Bay.

Rail and trucking transportation is well developed. The state-owned British Railways operates a 16,629 km 1.435 m standard-gauge system with 4,205 km of electrified and 12,591 km of double or multiple track. In addition, standard and narrow-gauge lines are privately owned and operated. Northern Ireland Railways operates a 332-km, 1.600-m gauge system with 190 km of double track.

All three major steel-producing areas are on or near tidewater. Petroleum refineries are likewise on the coast. The major cargo ports are Bristol, Liverpool, London, and Southampton in England, Glasgow in Scotland, Cardiff and Milford Haven in Wales, and Belfast in Northern Ireland.

In the United Kingdom and Europe, transportation changed significantly with the completion and operation of the Channel Tunnel. The tunnel, referred to as the "Chunnel," has been constructed underneath the English Channel and connects Folkestone, England, and Coquelles, near Calais, France. From these terminals, people drive their cars and trucks onto trains that transport them 49 km to the other side in about 30 minutes. Everything transported through the tunnel will move by rail. The Channel Tunnel, linking the two countries, was expected to be a vital component of the European single-market concept.

The United Kingdom is a significant player in the world mining and mineral-processing industries. This is more the result of an extensive range of companies in the country, with various interests in the mineral industry international, rather than production from the domestic industry. This is expected to continue.

Exploration is expected to continue onshore and offshore. Onshore exploration activities will be directed mainly toward precious metals. Offshore exploration interest will continue to be focused on North Sea areas, particularly the areas west of the Shetland Islands, the Central North Sea, and the Southern Gas Basin.

The Department of Trade and Industry's publication "UK Strategy for Sustainable Development" is expected to be used as a significant framework for the development of mineral resources. Efforts to raise the level of environmental

management and to maximize the best use of natural resources, including use of recycled materials and alternate sources of energy will continue.

## References Cited

- British Steel Plc, 1996a, British Steel unveils most significant innovation in steel construction for over 40 years: British Steel Plc press release, May 13. (Accessed September 29, 1997, on the World Wide Web at URL <http://www.britishsteel.co.uk/slimdek.htm1>)
- 1996b, Steel—Processes and applications: British Steel Plc and the environment, August 16. (Accessed September 29, 1997, on the World Wide Web at URL <http://www.britishsteel.co.uk/envirp&a.htm>)
- Coal Age, 1996, News—Great Britain: Coal Age, v. 102, no. 6, p. 14.
- Department of Trade and Industry, 1995, Richard Page extends oil and gas exploration to new frontiers: Department of Trade and Industry press release, November 21. (Accessed October 30, 1997, on the World Wide Web at URL <http://www.coi.gov.uk/coi/depts GTI/coi2812b.ok>)
- 1996, Cracking Europe: Department of Trade and Industry press release, February 19. (Accessed September 30, 1997, on the World Wide Web at URL <http://www.worldserver.pipex.com/coi/depts/GTIcoi5695.ok>)
- 1995, UK strategy for sustainable development: Department of Trade and Industry, 1995.
- Industrial Minerals, 1996a, Deepwood to increase production in 1996: Industrial Minerals, no. 342, p. 19.
- 1996b, Ledmore marble leaves for Carrara by train: Industrial Minerals, no. 342, p. 17.
- Mining Journal, 1996, UK gold search: Mining Journal [London], v. 327, no. 8391, p. 125.
- Murdock, Bill, 1996, Ennax to continue drilling in Sperrin: Irish Times, July 28. (Accessed September 28, 1997, on the World Wide Web at URL <http://1996/0702/fin7.htm> <http://www.irish-times.com/irish-times/paper1>).
- Norsk Hydro ASA, 1997, Expansion in the UK: NorskHydro ASA press release, July 1, 1997. (Accessed September 24, 1997, on the World Wide Web at URL <http://www.hydro.com/konsem/press/p199770701134107.shtml>)
- Northern Miner, 1996, Scotland's first gold mine: Northern Miner, v. 82, no. 38, September 2, p. B7.
- Taylor, Andrew, 1996, Blue Circle makes first Canadian purchase: London, Financial Times, March 25, 1996, p. 20.
- World Coal, 1997, Negotiating the future of UK coal: World Coal, March, p. 20.
- Wright, G.D., 1996, [Untitled]: South Crofty Holdings Ltd. Press release, August 21. (Accessed on the World Wide Web at URL <http://www.rewgroup.com/sfh/aug2196.htm>)

## Major Sources of Information

- British Geological Survey  
Keyworth, Nottingham NG125GG  
United Kingdom
- Central Statistics Office  
Great George Street  
London, SW1P3AQ  
United Kingdom
- Department of Economic Development  
(Northern Ireland)  
Belfast BT1 3AJ  
Northern Ireland
- Department of the Environment  
Minerals Division  
2 Marsham Street  
London SW1P3EB
- Department of Trade and Industry  
123 Victoria Street  
London SW1E 6RB  
United Kingdom

TABLE 1  
UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1992	1993	1994	1995	1996 e/
<b>METALS</b>					
<b>Aluminum:</b>					
Alumina from imported bauxite e/	120,000	105,000	105,000	108,000 r/	100,000
<b>Metal:</b>					
Primary	244,168	239,099	231,223	237,899	239,963 2/
Secondary	252,000	274,000	248,900	282,000	280,000
Cadmium, metal including secondary	383	458	469	549	541 2/
<b>Copper: Metal, refined:</b>					
Primary	10,363	10,629	11,078	12,007 r/	12,869 2/
Secondary	31,704	35,949	35,586	42,993	43,746 2/
Total	42,067	46,578	46,664	55,000 r/	56,615 2/
<b>Iron and steel:</b>					
<b>Iron ore:</b>					
Gross weight	30,900	1,068 r/	1,271 r/	1,051 r/	1,180 2/
Fe content	7,130	253	293	242 r/	271
<b>Metal:</b>					
Pig iron	11,542 r/	11,534	11,943	12,236 r/	12,871 2/
<b>Ferrous alloys, blast-furnace:</b>					
Ferromanganese	137	45	--	--	--
Steel, crude	16,212	16,625	17,286	17,604 r/	18,220 2/
Rolled products	14,000	13,500	14,000	19,119 r/	19,000
<b>Lead:</b>					
Mine output, Pb content e/	1,000	1,000	2,000	1,600	1,800
<b>Metal:</b>					
<b>Smelter:</b>					
Bullion from imported concentrate	42,164	45,183	36,619	41,642 r/	41,991 2/
Secondary (refined) e/ 3/	100,000	154,193	100,000	100,000	100,000
Total e/	142,164	199,376	136,619	141,642 r/	141,991
<b>Refined:</b>					
Primary 4/	198,805	209,560	191,036	149,706 r/	168,108 2/
Secondary 3/	147,990	154,193	161,430	170,998 r/	177,466 2/
Total e/	346,795	363,753	352,466	320,704 r/	345,574 2/
Magnesium metal, secondary including alloys e/	800	1,000	1,000	1,500	1,000
Nickel metal, refined e/ 5/	28,000	27,000	28,400	35,100 r/	36,000
<b>Tin:</b>					
Mine output, Sn content	2,040	2,232	1,922	1,972 r/	2,103 2/
Metal, secondary (refined) e/	100	100	100	100	100
Zinc: Metal, smelter	96,813	102,391	101,300	105,998 r/	96,867 2/
<b>INDUSTRIAL MINERALS</b>					
Barite 6/	76,723	32,623	54,000	85,000 e/	102,000 2/
Bromine	29,903	27,423	33,800	26,200 r/	28,000
Cement, hydraulic	11,006	11,039	12,493	11,805 r/	11,600
<b>Clays:</b>					
Fire clay	572	479	679	708 r/	700
Fuller's earth 7/	189	187	134	132 r/	135
Kaolin (China clay) 8/	2,502	2,461	2,530	2,586 r/	2,500
Ball clay and pottery clay 8/	744	746	825	893 r/	866 2/
Other, including shale	12,155	10,891	12,464	14,000 e/	13,000
Diatomite e/	120	200	180	--	--
Feldspar (china stone)	8,243	6,960	7,000 r/	8,900 r/	9,000
Fluorspar, all grades 9/	76,129	70,285	50,000	55,000 e/	60,000
Gypsum and anhydrite e/	3,000	2,500	2,000	2,000	65,000
Lime, quicklime and hydrated e/	2,500	2,500	2,500	2,500	2,500
Nitrogen, N content of ammonia	869	873	1,006	1,000 e/	1,000
Potash, K <sub>2</sub> O equivalent	529,000	550,000	580,000	582,000 r/	580,000
<b>Salt:</b>					
Rock e/	1,500	1,200	1,700	1,800	1,800
From brine e/	1,200	1,300	1,300	1,300	1,300
In brine, sold or used as such	3,400	4,080	4,004	3,548 r/	3,500
<b>Sand and gravel: e/</b>					
Common sand and gravel	88,900 2/	89,500	91,450	101,732 r/	96,000
Industrial sand	3,620	4,000	4,038	4,200 e/	2,000
Sodium compounds, n.e.s., carbonate e/	1,000	1,000	1,000	1,000	1,000

See footnotes at end of table.

TABLE 1--Continued  
 UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1992	1993	1994	1995	1996 e/
<b>INDUSTRIAL MINERALS--Continued</b>					
<b>Stone:</b>					
<b>Crushed:</b>					
Calcite e/ do.	4	4	3	--	--
Chalk do.	9,171	9,076	10,236	9,949 r/	10,000
Dolomite do.	18,539	17,985	17,616	17,952 r/	16,000
Igneous rock do.	57,654	57,766	56,494	57,061 r/	50,000
Limestone do.	89,399	93,727	106,626	94,441 r/	81,000
Sandstone do.	14,890	16,059	18,974	19,494 r/	17,000
Slate including fill do.	326	462	308	195 r/	300
Total e/ do.	189,983	195,079	210,257	199,092 r/	174,300
<b>Dimension: e/</b>					
Igneous do.	100	100	100	100	100
Limestone do.	200	200	200	200	200
Sandstone do.	200	200	200	200	200
Slate do.	66	61	60	60	60
Strontium minerals	2,000	1,000	--	--	--
<b>Sulfur, byproduct: e/</b>					
Of metallurgy	53,900 r/	61,900 r/	70,500 r/	62,300 r/	60,000
Of petroleum refining	177,000 r/	202,000 r/	162,000 r/	140,000 r/	150,000
Total	230,900 r/	263,900 r/	232,500 r/	202,300 r/	210,000
Talc, soapstone, pyrophyllite	5,216 r/	5,317 r/	5,275	4,298 r/	5,322 2/
Titania e/ 10/	108,000	85,400	85,000	85,000	100,000
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
<b>Coal:</b>					
Anthracite thousand tons	2,040	1,404	1,000	1,000	1,000
Bituminous including slurries, fines, etc. do.	82,453 r/	66,795 r/	47,971	52,630 r/	50,515
Lignite do.	3	2	2	2	2
Total do.	84,496 r/	68,201 r/	48,973	53,632 r/	51,517
<b>Coke:</b>					
Metallurgical	6,397	6,030	6,164	6,187 r/	6,220
Breeze, all types	131	61	38	41 r/	40
Fuel briquets, all grades e/	1,000	1,000	1,034	841	796 2/
<b>Gas, natural:</b>					
Marketable 11/ million cubic meters	64,100	65,500	69,700	75,461 r/	89,900
Marketed 12/ do.	50,200	52,800	57,200	62,300 e/	65,000
Natural gas liquids 13/ thousand 42-gallon barrels	35,300	40,700	53,200	97,440	93,960 2/
Peat: thousand tons	390	380	500	590	550
<b>Petroleum: thousand 42-gallon barrels</b>					
Crude 14/ do.	707,000	749,000	892,740	914,250 r/	924,000
<b>Refinery products:</b>					
Liquefied petroleum gases do.	18,500	18,400	20,138	22,597 r/	22,875 2/
Naphtha including white spirit do.	26,100	23,100	23,900	24,259 r/	24,000
Gasoline do.	249,000	253,000	234,277	231,660	238,390 2/
Jet fuel do.	61,500	66,700	61,600	62,696	66,440
Kerosene do.	19,000	20,000	22,994	22,661	27,203 2/
Distillate fuel oil do.	191,000	204,000	202,442	202,681	215,616 2/
Residual fuel oil do.	82,500	83,000	75,777	73,053 r/	76,450
Lubricants do.	8,140	8,200	9,072	8,827	7,777 2/
Bitumen do.	14,200	15,000	15,568	14,902	13,265 2/
Petroleum coke thousand 42-gallon barrels	2,940	3,000	3,735	4,174 r/	4,000
Petroleum wax do.	488	500	503	362 r/	400
Unspecified e/ do.	3,300	3,500	4,361	30,177	30,590 2/
Refinery fuel and losses do.	42,500	42,000	42,000	42,000	40,000
Total e/ do.	719,168	740,400	716,367	740,049 r/	767,006

e/ Estimated. r/ Revised.

1/ Table includes data available through June 1997.

2/ Reported figure.

3/ Includes a small quantity of primary lead from domestic concentrate.

4/ Produced entirely from imported bullion and includes the lead content of alloys.

5/ Refined nickel and nickel content of ferronickel.

TABLE 1--Continued  
 UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES 1/

- 6/ Includes witherite.  
 7/ Salable product.  
 8/ Sales, dry weight.  
 9/ Proportions of grades not available; probably about two-thirds acid grade.  
 10/ Sales.  
 11/ Methane, excluding gas flared or reinjected.  
 12/ Marketable methane, excluding that used for drilling, production, and pumping operations.  
 13/ Includes ethane, propane, butane, and condensates.  
 14/ Excludes gases and condensates.

TABLE 2  
 UNITED KINGDOM: 1995 BALANCE OF PAYMENTS, SELECTED MINERAL COMMODITIES 1/

(Thousand dollars)

Mineral commodity	Exports to EU	Imports from EU	Net gain or (loss)	Exports to the world	Imports from the world	Net gain or (loss)
<b>Crude industrial minerals:</b>						
Feldspar	\$46	\$1,811	(\$1,765)	\$110	\$3,322	(\$3,212)
Magnesite	78	2,927	(2,849)	278	3,983	(3,705)
Slate	72	1,261	(1,189)	1,452	4,003	(2,551)
Other	551,372	240,439	310,933	763,675	567,399	196,276
<b>Total</b>	<b>551,568</b>	<b>246,438</b>	<b>305,130</b>	<b>765,515</b>	<b>578,707</b>	<b>186,808</b>
<b>Metalliferous ores:</b>						
Copper	488	457	31	771	932	(161)
Lead	33	11,242	(11,209)	76	11,242	(11,166)
Tin	1,566	20	1,546	8,848	22	8,826
Zinc	--	5,694	(5,694)	76	53,338	(53,262)
Other, including waste and scrap	695,449	523,404	172,045	1,183,244	2,288,030	(1,104,786)
<b>Total</b>	<b>697,536</b>	<b>540,817</b>	<b>156,719</b>	<b>1,193,015</b>	<b>2,353,564</b>	<b>(1,160,549)</b>
<b>Nonmetallic mineral manufactures</b>	<b>2,828,296</b>	<b>1,113,662</b>	<b>1,714,634</b>	<b>5,043,185</b>	<b>4,939,341</b>	<b>103,844</b>
<b>Metals:</b>						
Iron and steel	4,673,426	4,449,280	224,146	6,888,105	5,699,533	1,188,572
Mercury	26	38	(12)	170	62	108
Other nonferrous metals	2,754,187	2,368,944	385,243	4,491,799	6,021,476	(1,529,677)
<b>Total</b>	<b>7,427,639</b>	<b>6,818,262</b>	<b>609,377</b>	<b>11,380,074</b>	<b>11,721,071</b>	<b>(340,997)</b>
<b>Mineral fuels</b>	<b>9,320,382</b>	<b>2,044,530</b>	<b>7,275,852</b>	<b>14,521,521</b>	<b>9,248,784</b>	<b>5,272,737</b>

1/ Table prepared by Glenn J. Wallace, International Data Unit.

TABLE 3  
 UNITED KINGDOM: VALUE OF SELECTED MINERAL COMMODITIES e/

(Million dollars 1/)

Mineral	1991	1992	1993	1994	1995
Ball clay	42	47	56	64	69
Chalk	69	61	61	71	72
China clay (kaolin)	328	343	370	354	370
Fluorspar	16	14	14	11	10
Fuller's earth	23	23	24	19	19
Gypsum and anhydrite	35	29	29	29	32
Limestone and dolomite	852	782	826	960	995
Potash	103	109	114	134	135
Salt	72	79	82	100	303
Silica sand	74	58	58	64	93

e/ Estimated.

1/ Value has been converted from pound sterling (£) to U.S. dollars (\$) at the rate of £1.00 =US\$1.61, the average rate during 1996.

Source: British Geological Survey "United Kingdom Minerals Yearbook 1996."

TABLE 4  
 UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY FOR 1996  
 (Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aggregate	ARC Ltd. (Hanson Plc., 100%) Foster Yoeman Ltd.	50 quarries in various locations Glensanda quarry at Oban	50,000 15,000
Aluminum, primary	British Alcan Aluminium Ltd.	Fort William, Kinlochleven, and Lynemouth	175
Do.	Anglesy Aluminium Ltd. (Rio Tinto Corp. 51%; Kaiser Aluminum and Chemical Corp., 49%)	Holyhead, Wales	113
Aluminum, secondary	Trent Alloys Ltd. (Cookson Group, 100%)	North Cave, Humberside	30
Do.	Deeside Aluminium Ltd.	Clwyd, Wales	45
Ball clay	Watts, Blake, Bearn & Co. Plc.	Various operations in northern and southern Devon	500
Celestite	Bristol Minerals Co. Ltd.	Yate, Avon	30
Cement	Aberthaw and Bristol Channel Portland Cement Co. Ltd	East Aberthaw and Rhoose, Glamorgan	1,000
Do.	Blue Circle Industries PLC	Main plants at Couldon, Dunbar, Hope, Northfleet, Weardale, and Westbury	11,000
Do.	Castle Cement Ltd. (Aker Norcem AS, 50%; Indus AB Euroc, 50%;	Main plants at Ketton, Ribblesdale, Pades, and Pitstone	4,000
China clay (kaolin)	ECC Group Plc.	Mines and plants in Devonshire	3,000
Coal	RJB Mining Plc.	19 mines in various locations	40 1/
Copper	IMI Refiners Ltd.	Refinery at Walsall, West Midlands	80
Ferroalloys	British Steel Plc.	Teesside, Cleveland	80
Do.	Murex Ltd.	Rainham, Essex	25
Do.	London and Scandinavian Metallurgical Co. Ltd.	Rotherham, South Yorkshire	30
Fluorspar	Weadale Fluorspar Ltd.	Mines in Derbyshire	50
Do.	Laporte Industries	Mill at Stoney Middleton, Mines in Derbyshire	70
Do.	British Gypsum Ltd.	Mines in Midlands, Cumbria, and Sussex	3,500
Lead, refined	Britania Refined Metals Ltd.	Northfleet, Kent	165
Lead, secondary	H.J. Enthoven and Son Ltd. (Billiton (U.K.) Ltd., 100%)	Darley Dale, Derbyshire	60
Lead, smelter	MIM Holdings (U.K) Ltd.	Avonmouth, Avon	55
Natural gas	Amoco Ltd. British Petroleum Ltd. Esso (U.K.) Ltd., Phillips Petroleum Co. Plc., Shell (U.K.) Ltd.	North Sea gasfields	1,250 2/
Nickel, refined	INCO Europe Ltd. (INCO Ltd., Canada)	Clydach, Wales	30
Petroleum, crude	Amoco Ltd., British Petroleum Ltd., Chevron Ltd., Esso (U.K.) Ltd., Occidental Petroleum Co. Ltd., Shell (U.K.) Ltd., Texaco, Unocal, Inc.	North Sea oilfields	2.1 3/
Petroleum, refined	British Petroleum Ltd., Conoco Ltd., Mobil Oil Co. Ltd., and others	11 refineries in various locations	2.3 3/
Platinum-group metals	Johnson Matthey Plc.	Enfield (London) and Royston, Cambridgeshire	20
Potash	Cleveland Potash Ltd.	Boulby Mine, Yorkshire	500
Salt, rock	Imperial Chemical Industries Plc.	Mines at Winsford, Chesire	3,000
Do.	Irish Salt Mining and Exploration Co.	Carrick Fergus, Northern Ireland	300
Sand and gravel	TMC Pioneer Aggregates Ltd.	Chelmsford, Essex	1,000,000
Silica, sand	Hepworth Minerals and Chemicals Ltd.	Operations in Cambridgeshire, Cheshire, Humberside, and Norfolk	6,000
Steel	British Steel Plc.	4 intergrated steelworks in Gwent, Lanark, South Humberside, and Cleveland	18,000
Talc	Alex Sandison and Son Ltd.	Unst, Shetland Islands	15
Do.	Shetland Talc Ltd. (Anglo European Minerals Ltd., 50%; Dalriada Mineral Ventures Ltd. 50%	Cunningsburg, Shetland Islands	35
Tin, ore	Canon Consolidated Tin Mines Ltd.	South Crofty Mine, Cornwall	1,800
Titanium, sponge	Deeside Titanium Ltd.	Plant at Deeside, Clyde	5
Zinc, smelter	MIM Holdings (U.K.) Ltd.	Avonmouth, Avon	120

1/ Million metric tons.

2/ Billion cubic feet per year.

3/ Million 42-gallon barrels per day.